Metric Microscope Scavenger Hunt

Name: _____

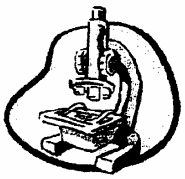
Date: _____

Class # _____

Directions

☺ Light microscopes on the TECH TRECK can magnify between 10X and 200X. They are best suited for viewing objects between 100 µm (0.1 mm) and 10 mm.

☺ The Intel Play microscopes magnify 10X, 60X, and 200X. They are good for viewing objects under 12 mm. Take a snapshot and **print a picture** with a scale bar of one of the items you view at this station. Staple it behind this sheet.



☺ The scanning electron microscope (SEM) can magnify between 7X and 30,000X. It is best suited for viewing items between 1 µm (1000 nm or 0.001 mm) and 12 mm. Be sure to **collect a picture** of an item that you viewed at this station. Staple it behind this sheet.

☺ Bring your metric notes with you on the bus. Work in small groups to estimate and measure items using the microscope.

Ant Leg

☺ Look at the list of objects below. Estimate the size in mm or µm (1000 µm = 1 mm) of any four items of your choice. Include at least three of the items on the list. After estimating the size, use the Intel Play or light microscope to measure the object and see how close you were.

- ❒diameter of human hair
- ❒sand or salt grain
- ❒seed
- ❒width of Lincoln on the tail side of a penny
- ❒period on a printed page
- ❒width of a bug leg, wing, or antennae

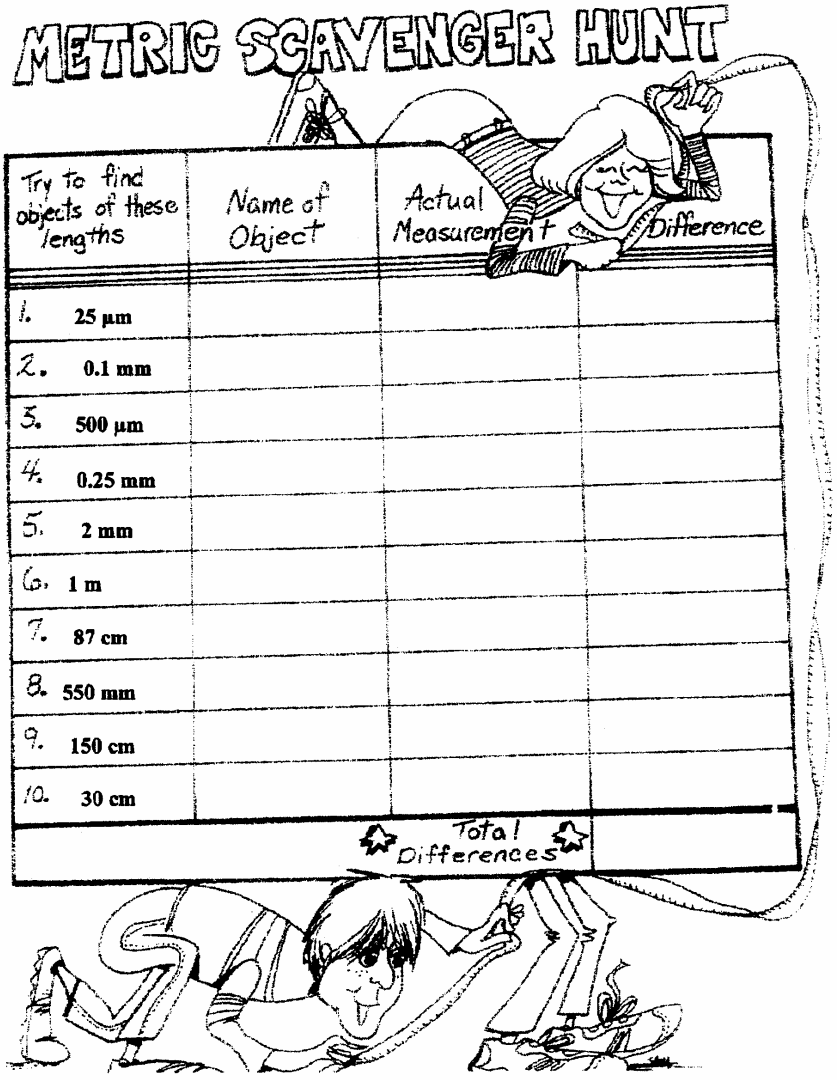
Object	Your Estimation (mm or µm)	Actual Size (mm or µm)

☺ As you learn how to measure very small things using microscopes, look for items that you think might have the approximate sizes below. Objects 1 through 4 will be hunted for on the TECH TRECK bus and measured at any of the microscopes. One of these items should be at the SEM.

☺ Objects 5 through 10 should be hunted and measured in the Science classroom.

☺ Find the difference between the actual length of the object and the measurement given. Differences should be recorded in mm. Add the total of all your differences in mm. A class winner will be determined for the lowest score, and bonus may be given for scores under 100.

METRIC SCAVENGER HUNT



Try to find objects of these lengths	Name of Object	Actual Measurement	Difference
1. 25 µm			
2. 0.1 mm			
3. 500 µm			
4. 0.25 mm			
5. 2 mm			
6. 1 m			
7. 87 cm			
8. 550 mm			
9. 150 cm			
10. 30 cm			
		Total Differences	

Metric Conversions

	Metric to English	English to Metric
Length	1 kilometer (km) = 0.621 mile (mi)	1 mi = 1.61 km
	1 meter (m) = 3.28 feet (ft)	1 ft = 0.305 m
	1 centimeter (cm) = 0.394 inch (in)	1 in = 2.54 cm
Area	1 square meter (m^2) = 10.773 square feet (ft^2)	1 ft^2 = 0.0929 m^2
	1 square centimeter (cm^2) = 0.155 square inch (in^2)	1 in^2 = 6.452 cm^2
Volume	1 cubic meter (m^3) = 35.315 cubic feet (ft^3)	1 ft^3 = 0.0283 m^3
	1 cubic centimeter (cm^3) = 0.0610 cubic inches (in^3)	1 in^3 = 16.39 cm^3
	1 liter (l) = 0.2642 gallon (gal)	1 gal = 3.79 l
	1 liter (l) = 1.06 quart (qt)	1 qt = 0.94 l
Mass	1 kilogram (kg) = 2.205 pound (lb)	1 lb = 0.4536 kg
	1 gram = 0.0353 ounce (oz)	1 oz = 28.35 g
		1 lb = 453.6 g
Temperature	Celsius (°C) = 5/9(°F - 32)	Fahrenheit (°F) = 9/5 °C + 32
	0 °C = 32 °F (freezing point of water)	72 °F = 22 °C (room temp)
	100 °C = 212 °F (boiling point of water)	98.6 °F = 37 °C (human body temp)
	15 °C = 59 °F (standard atmospheric temp)	

Metric Base Units = 1

length = meter (m)

area = square meter (m^2)

volume = liter (l)

1 cubic centimeter (cc or cm^3) =
1 milliliter (ml)

mass = kilogram (kg)
gram (g)

1 ml of distilled water = 1 g

temperature = degrees Celsius (°C)
Kelvin (K)

Metric Prefixes - Symbols and Meanings

exa (E) = 1,000,000,000,000,000,000 = one quintillion

peta (P) = 1,000,000,000,000,000 = one quadrillion times

tera (T) = 1,000,000,000,000 = one trillion times

giga (G) = 1,000,000,000 = one billion times

mega (M) = 1,000,000 = one million times

kilo (k) = 1000 = one thousand times

hecto (h) = 100 = one hundred times

deka (da) = 10 = ten times

deci (d) = 0.1 = one tenth of

centi (c) = 0.01 = one hundredth of

milli (m) = 0.001 = one thousandth of

micro (μ) = 0.000001 = one millionth of

nano (n) = 0.000000001 = one billionth of

pico (p) = 0.000000000001 = one trillionth of

femto (f) = 0.000000000000001 = one quadrillionth of

atto (a) = 0.000000000000000001 = one quintillionth of